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JUL 16 1964
CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
ARIZONA

UNITED STATES DEPARTMENT of AGRICULTURE···SOIL CONSERVATION SERVICE.
SALT RIVER VALLEY WATER USERS ASSOCIATION
and
ARIZONA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with the Federal, State and private organizations listed on the last page of this report.

AS OF
FEB. 1, 1964

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from advance estimates of the streamflow.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, up to 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

Streamflow forecasts are obtained by a comparison of total or maximum snow accumulation, as measured by snow water equivalent, to the subsequent spring and summer or snowmelt season runoff over a period of years. The snow water equivalent measured in selected snow courses provides most of the index to the streamflow forecast for the following season. More accurate forecasts are usually obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast procedure. Early season forecasts assume average climatic conditions through the snowmelt season.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions. Soil Conservation Service Reports may be secured from Water Supply Forecasting Unit, Soil Conservation Service, P.O. Box 2807, Portland, Oregon 97208.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	LOCATION	COOPERATING WITH
RIVER BASINS			
Western United States	Monthly (Feb.-May)	Portland, Oregon	All Cooperators
Basic Data Summary	October 1	Portland, Oregon	All Cooperators
STATES			
Alaska	Monthly (Mar.-May)	Palmer, Alaska	Alaska S.C.D.
Arizona	Semi-Monthly (Jan.15 - Apr.1)	Phoenix, Arizona	Salt R. Valley Water Users Assoc. Ariz. Agr. Exp. Station
Colorado and New Mexico	Monthly (Feb.-May)	Fort Collins, Colorado	Colo. State University Colo. State Engineer N. Mex. State Engineer
Idaho	Monthly (Jan.-June)	Boise, Idaho	Idaho State Reclamation Engineer
Montana	Monthly (Jan.-June)	Bozeman, Montana	Mont. Agr. Exp. Station
Nevada	Monthly (Jan.-May)	Reno, Nevada	Nevada Dept. of Conservation and Natural Resources - Division of Water Resources
Oregon	Monthly (Jan.-June)	Portland, Oregon	Oreg. State University Oregon State Engineer
Utah	Monthly (Jan.-June)	Salt Lake City, Utah	Utah State Engineer
Washington	Monthly (Feb.-June)	Spokane, Washington	Wn. State Dept. of Conservation
Wyoming	Monthly (Feb.-June)	Casper, Wyoming	Wyoming State Engineer

PUBLISHED BY OTHER AGENCIES

REPORTS	ISSUED	AGENCY
British Columbia	Monthly (Feb.-June)	Water Resources Service, Dept. of Lands, Forest and Water Resources, Parliament Bldg., Victoria, B.C., Canada
California	Monthly (Feb.-May)	Calif. Dept. of Water Resources, P.O. Box 388, Sacramento, Calif.

USDA SCS PORTLAND OREG 1963

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
ARIZONA

(Salt, Verde, Gila and Part of Lower Colorado River Basin)

Report prepared by

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PHOENIX, ARIZONA 85025

Issued by

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STATE CONSERVATIONIST
SOIL CONSERVATION SERVICE

VICTOR I. CORBELL
PRESIDENT
SALT RIVER VALLEY WATER USERS ASSOCIATION

ARIZONA
COOPERATIVE SNOW SURVEYS
Snow Courses and Sub-Watersheds

JANUARY 1964

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE USDA SCS-PORTLAND OREG 1960 M-2690

7-0-19920-L

INDEX to SNOW COURSES and SOIL MOISTURE STATIONS

NUMBER **	NAME	SEC	TWP	RGE ***	ELEVATION	RIVER BASIN
9S1	Baldy (p)	28	7N	27E	9125	Salt-Little Colorado
10T1	Bear Wallow	6	12S	16E	8100	Gila
9S6	Beaver Head	13	4N	30E	8000	Salt-San Francisco
9S10-*	Black River Divide	11	6N	27E	9100	Salt-Little Colorado
12N1	Bright Angel	34	33N	3E	8400	Lower Colorado
12R1	Camp Wood	3	16N	6W	5700	Verde-Bill Williams
10R7-M	Canyon Creek #2	18	11N	15E	7500	Salt-Little Colorado
11R2-M	Casner Park	19	18N	8E	6930	Verde
12P1-M	Chalender	27	22N	3E	7100	Verde
12R6	Copper Basin Divide(p)	23	13N	3W	6720	Verde-Bill Williams
10R8-*	Corduroy Creek	Lat.34°07'	N. Long.110°08'W.	§	6000	Salt
9S7	Coronado Trail	26	5N	30E	8000	Salt-San Francisco
10R6	Forest Dale	2	9N	21E	6430	Salt-Little Colorado
11P2	Fort Valley (p)	22	22N	6E	7350	Verde-Little Colorado
9R5	Ft. Apache	18	7N	27E	9160	Salt-Little Colorado
8S1-M	Frisco Divide	31	6S	20W****	8000	San Francisco-Gila
12R4	Gaddes Canyon	11	15N	2E	7600	Verde-Agua Fria
10R5	Gentry	36	11N	15E	7600	Salt
11P1	Grand Canyon	21	30N	4E	7500	Lower Colorado
9S11	Hannagan Meadows (p)	19	3N	29E	9090	Salt
11R5	Happy Jack	30	17N	9E	7630	Verde
10R4	Heber (p)	28	11N	15E	7600	Salt-Little Colorado
8S9-A	Hummingbird	19	11S	17E	10,550	San Francisco-Gila
8S6	Ice King	6	11S	18W****	8020	San Francisco-Gila
7S2	Inman	6	11S	10W****	7800	Gila
12R2	Iron Springs	22	14N	3W	6200	Verde-Bill Williams
9S2	Maverick Fork (p)	13	6N	27E	9050	Salt
9R2-M	McNary	14	8N	23E	7200	Salt-Little Colorado
9R1	Milk Ranch	28	8N	23E	7000	Salt
12R3	Mingus Mountain	3	15N	2E	7100	Verde-Agua Fria
8S2	Mogollon	2	11S	19W****	7000	San Francisco-Gila
11R4	Mormon Lake	13	18N	8E	7350	Verde-Little Colorado
11R3-M	Mormon Mountain (p)	14	18N	8E	7500	Verde
11R1-M	Munds Park	7	18N	7E	6500	Verde
11P5-M	Newman Park	25	19N	6E	6750	Verde
9S4	Nutrioso	23	6N	30E	8500	San Francisco-Little Colorado
9S5	Pacheta	At Town of Maverick, Ariz.			§7800	Salt
8S7	Redstone Trail	5	11S	18W****	8600	San Francisco-Gila
10T2	Rose Canyon	15	12S	16E	7300	Gila
8S8	Silver Creek Divide	4	11S	18W****	9000	San Francisco
11P4	Snow Bowl (p)	36	23N	6E	10,260	Verde
9S8	State Line	6	6S	21W****	8000	Gila-San Francisco
12R5	White Spar	19	13N	2W	6000	Verde
8S10-A	Whitewater	19	11S	17E	10,750	Gila
13P1	Willow Ranch	16	21N	11W	5000	Bill Williams
10S1	Workman Creek	33	6N	14E	6900	Salt

* Soil Moisture Station only

** Number indicates location of snow course within coordinate rectangle. Thus 9N1 is Course #1 in coordinate rectangle 9N.

*** All in Gila and Salt River Base and Meridian except where otherwise indicated.

**** New Mexico Principal Meridian

M Soil Moisture Station installed on or in vicinity of snow course.

§ Unsurveyed

(p) Storage gage installed on or in vicinity of snow course.

A Aerial Snow Depth Gage

ARIZONA WATER SUPPLY OUTLOOK

FEBRUARY 1, 1964

* *

* The Water Supply Outlook for Arizona is below normal. *
* The present snow cover is only one-third of average *
* for this date. Reservoir Storage is near normal on *
* the Salt River Project, but below average in San *
* Carlos Reservoir and Lake Pleasant. Streamflow is *
* expected to be between one-third and one-half of *
* normal. *

* *

SNOW COVER: The recent storm has placed some snow in the previously bare mountains of Arizona and western New Mexico. Only the western portion of the Verde Watershed received no snow. All snow courses, however, reported below normal snow cover. Percentages range from 25% of average on the Verde River Watershed to 43% of average on the Salt River Watershed. The most significant deficiency exists in the White Mountains above the 9000' elevation; this high water-producing area normally has four times the amount of snow now present. The new aerial markers in the Mogollon Mountains indicate the greatest snow depth with a maximum of 38" containing about 5.3 inches of water.

RESERVOIR STORAGE: The Salt River Project Reservoirs now contain slightly above the average amount of water in storage on this date. This storage is, however, only 39% of capacity. San Carlos Reservoir and Lake Pleasant contain 66% and 74% of average, respectively. Lyman Reservoir contains considerably above normal storage as a result of the heavy runoff in the spring of 1962. Watson Lake is still 83% full from last summer's heavy storms.

SOIL MOISTURE: As a result of good precipitation last summer and during early winter, soil moisture is fair on most watersheds. The western Verde Watershed is the dryest; good runoff on the Verde River is not likely even with much above normal precipitation the rest of the season.

PRECIPITATION: Although January precipitation was improved over that received during December, it was still only about one-third of normal. These two low precipitation months are the main reason for the poor water supply outlook.

STREAMFLOW AND WATER SUPPLY: January streamflow has been below average on all major streams. The Salt River produced only 9000 Acre Feet last month compared to the 15-year average of 50,500 Acre Feet. The Verde and Gila Rivers are holding a little better, producing slightly less than half normal.

Streamflow forecasts range from about 35% of average on the Verde, Tonto, and Little Colorado Rivers, to 52% on the Gila River. The Salt River is forecast to flow 110,000 Acre Feet, or 40% of average. Granite Creek is expected to flow enough water to fill Watson Lake providing subsequent precipitation is normal.

Water supplies will be somewhat short in most areas of Arizona. Supplemental pumping will be required. Efficient use of irrigation water on farms will help greatly to stretch this meager water supply.

STREAM FLOW FORECASTS - FEBRUARY 1, 1964

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts.

SUB-WATERSHED, STREAM and STATION	SEASONAL STREAM FLOW IN THOUSANDS OF ACRE FEET FORECAST PERIOD: JANUARY - MAY, INCLUSIVE					
	Forecast Runoff 1964	Percent 15-Year Average	Measured Runoff 1963	1962	1961	1943-57 Average
Salt River at Intake	110	40	206.4	605.7	87.0	276.9
Tonto River above Roosevelt	16	34	11.6	59.9	6.6	47.7
Verde River above Horseshoe	67	35	58.6	250.3	72.6	192.4
Gila River nr. Virden	26	53	67.6	145.2	23.7	48.8
Gila River near Solomon	49	52	125.6	286.6	34.8	94.8
Frisco River at Clifton	24	53	54.2	142.0	18.1	45.3
Little Colorado River above Lyman Dam (JAN.-JUNE, Incl.)	2.3	35	3.1	27.3	1.4	6.6

STATUS OF ARIZONA RESERVOIR STORAGE - ABOUT FEBRUARY 1, 1964

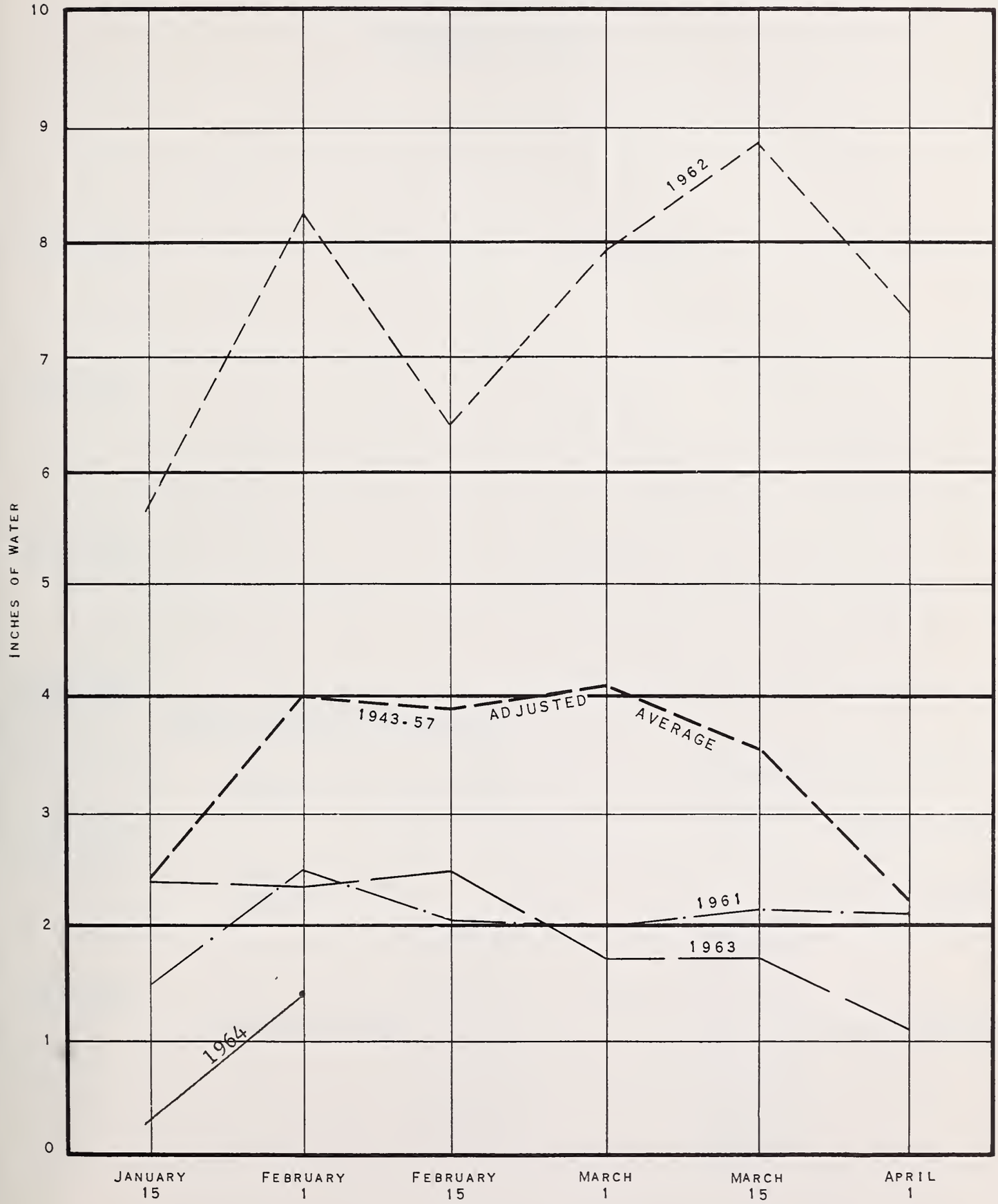
SUB-WATERSHED and/or STREAM	RESERVOIR	USABLE CAPACITY 1000s AC. FT.	USABLE STORAGE - 1000s ACRE FEET			
			1964	1963	1962	15-Year Average 1943-57
GILA RIVER SUB-WATERSHED						
Agua Fria	Lake Pleasant	163.8	16.2	2.7	12.3	22.9
Granite	Watson Lake	4.7	3.9	0.7	--	--
Gila	San Carlos	1,206.0	65.4	73.5	110.9	98.4
Verde	Bartlett	179.5	11.2	19.8	58.8	41.4
Verde	Horseshoe	142.8	8.3	1.4	3.3	12.7 *
Salt	Roosevelt	1,382.0	434.8	654.7	590.8	442.3
Salt	Apache	245.0	238.8	230.3	162.2	194.1
Salt	Canyon	58.0	51.5	51.0	56.8	33.4
Salt	Saguaro	70.0	61.7	49.5	65.2	28.7
LOWER COLORADO RIVER SUB-WATERSHED						
Colorado	Lake Havasu	619.4	547.2	540.9	566.7	549.4
Colorado	Lake Mohave	1,810.0	1,696.0	1,682.0	1,681.0	1,426.6 *
Colorado	Lake Mead	27,207.0	15,448.0	22,676.0	17,898.0	17,488.0
Little Colo.	Lyman	30.6	9.9	12.9	1.2	5.9
Little Colo.	Show Low Lake	5.1	0.8	0.6	0.2	--

* Average is for less than 15 years of record in the 1943-57 period.

RELATIVE SNOW WATER ACCUMULATION

ARIZONA

FEBRUARY 1, 1964

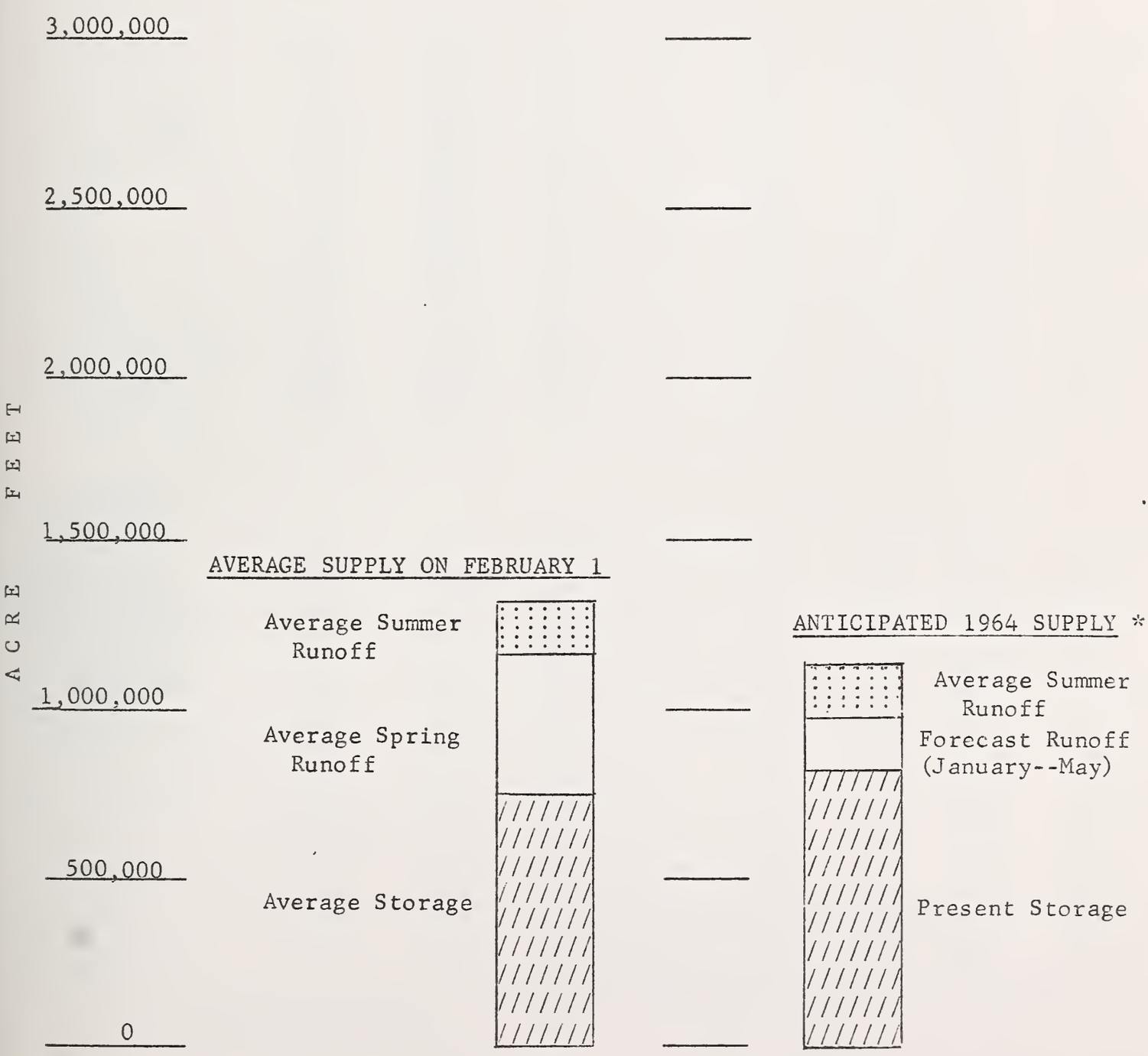


This graph represents the average snow water content on eleven selected snow courses on Arizona Sub-Watersheds.

WATER SUPPLY INVENTORY

SALT RIVER VALLEY SYSTEM

FEBRUARY 1, 1964



* Based on present Storage + Forecast Spring runoff + Average Summer runoff.

ARIZONA SNOW SURVEYS - ABOUT FEBRUARY 1, 1964

SUB-WATERSHED and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1964 Date of Survey	Snow Depth (In.)	Water Content (In.)	PAST RECORD Water Content (Inches) 1963	1962	1943-57 Average
GILA RIVER								
Bear Wallow	10T1	8100	2/1	5	3.0	4.4	14.6	3.2 **
Beaver Head	9S6	8000	1/23	4	1.4	2.4	8.3	2.9
Coronado Trail	9S7	8000	1/31	4	0.7	1.9	5.2	2.6
Frisco Divide	8S1-M	8000	1/31	3	0.8	1.0	4.0	2.1
Hummingbird 1/	8S9-A	10550	1/30	38	5.3	---	---	---
Ice King	8S6	8020	1/30	12	2.1	5.8	7.6	---
Inman	7S2	7800	1/30	0	0.0	1.2	1.4	0.6 **
Mogollon	8S2	7000	1/30	0	0.0	1.9	5.4	1.0 **
Nutrioso	9S4	8500	1/31	1	0.3	1.1	4.8	2.0
Redstone Trail	8S7	8600	1/30	11	2.4	10.0	12.0	---
Rose Canyon	10T2	7300	2/1	3	1.0	3.4	11.2	1.7 **
Silver Creek Div.	8S8	9000	1/30	16	3.3	---	---	---
State Line	9S8	8000	1/31	4	1.1	1.7	4.8	2.5
Whitewater 1/	8S10-A	10750	1/30	24	4.3	---	---	---
SALT RIVER								
Baldy *	9S1	9125	1/29	10	1.6	4.6	13.7	6.5 **
Beaver Head	9S6	8000	1/23	4	1.4	2.4	8.3	2.9
Canyon Creek #2	10R7-M	7500	1/28	10	2.0	2.3	6.7	---
Coronado Trail	9S7	8000	1/31	4	0.7	1.9	5.2	2.6
Forest Dale	10R6	6430	1/31	7	1.5	T	5.5	1.5
Ft. Apache *	9R5	9160	1/29	13	2.1	5.5	13.3	6.9 **
Gentry	10R5	7600	1/31	9	2.2	2.6	6.4	3.5 **
Hannagan Meadows	9S11	9090	1/28	13	2.5	---	---	---
Heber	10R4	7600	1/28	10	1.9	2.5	7.3	3.6 **
Maverick Fork	9S2	9050	1/29	11	1.7	4.6	15.8	7.6 **
McNary	9R2-M	7200	1/31	7	1.4	1.9	5.4	2.7
Milk Ranch	9R1	7000	1/31	5	1.3	T	6.0	2.0
Nutrioso *	9S4	8500	1/31	1	0.3	1.1	4.8	2.0
Pacheta	9S5	7800	1/30	6	1.8	No Survey	9.0	3.5 **
Workman Creek	10S1	6900	1/29	12	3.5	3.7	13.8	4.4 **

* On Adjacent Drainage
** 1943-57 Adjusted Average

1/ Aerial observation: Water contents estimated.

ARIZONA SNOW SURVEYS - ABOUT FEBRUARY 1, 1964

SUB-WATERSHED and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1964 Date of Survey	Snow Depth (In.)	Water Content (In.)	PAST RECORD Water Content (Inches) 1963	1962	1943-57 Average
VERDE RIVER								
Camp Wood	12R1	5700	1/31	0	0.0	0.0	2.1	1.4 **
Casner Park	11R2-M	6930	1/30	5	1.2	2.0	7.8	4.6 **
Chalender	12P1-M	7100	1/31	7	1.4	0.7	5.4	3.5 **
Copper Basin Div.	12R6	6720	1/31	0	0.0	0.0	---	---
Fort Valley	11P2	7350	1/31	4	0.5	0.0	3.9	3.0 **
Gaddes Canyon	12R4	7600	1/31	3	0.7	1.7	7.8	---
Happy Jack	11R5	7630	1/30	3	1.2	0.0	5.0	4.5 **
Iron Springs *	12R2	6200	1/31	0	0.0	0.0	2.4	1.7 **
Mingus Mountain	12R3	7100	1/31	0	0.0	0.0	3.4	1.8 **
Mormon Lake *	11R4	7350	1/30	9	2.0	2.1	7.6	5.3 **
Mormon Mountain	11R3-M	7500	1/30	8	1.8	1.7	9.0	7.2 **
Munds Park	11R1-M	6500	1/30	2	1.0	1.0	5.7	3.4 **
Newman Park	11P5-M	6750	1/30	4	1.1	0.9	---	---
Snow Bowl	11P4	10260	1/26	14	3.4	3.6	12.6	---
White Spar	12R5	6000	1/31	0	0.0	0.0	---	---
BILL WILLIAMS RIVER								
Camp Wood *	12R1	5700	1/31	0	0.0	0.0	2.1	1.4 **
Copper Basin Div.	12R6	6720	1/31	0	0.0	0.0	---	---
Iron Springs	12R2	6200	1/31	0	0.0	0.0	2.4	1.7 **
Willow Ranch	13P1	5000	1/31	0	0.0	0.0	T	0.9 **
LOWER COLORADO RIVER								
Bright Angel	12N1	8400	No Report			2.6	6.3	7.6 **
Chalender *	12P1-M	7100	1/31	7	1.4	0.7	5.4	3.5 **
Fort Valley	11P2	7350	1/31	4	0.5	0.0	3.9	3.0 **
Grand Canyon	11P1	7500	1/31	5	1.5	0.9	5.2	2.7 **
LITTLE COLORADO RIVER								
Baldy	9S1	9125	1/29	10	1.6	4.6	13.7	6.5 **
Canyon Creek #2	10R7-M	7500	1/28	10	2.0	2.3	6.7	---
Forest Dale	10R6	6430	1/31	7	1.5	T	5.5	1.5
Ft. Apache	9R5	9160	1/29	13	2.1	5.5	13.3	6.9 **
Fort Valley	11P2	7350	1/31	4	0.5	0.0	3.9	3.0 **
Gentry	10R5	7600	1/31	9	2.2	2.6	6.4	3.5 **
Happy Jack *	11R5	7630	1/30	3	1.2	0.0	5.0	4.5 **
Heber	10R4	7600	1/28	10	1.9	2.5	7.3	3.6 **
McNary	9R2-M	7200	1/31	7	1.4	1.9	5.4	2.7
Mormon Lake	11R4	7350	1/30	9	2.0	2.1	7.6	5.3 **
Mormon Mountain	11R3-M	7500	1/30	8	1.8	1.7	9.0	7.2 **
Nutrioso	9S4	8500	1/31	1	0.3	1.1	4.8	2.0
Snow Bowl	11P4	10260	1/26	14	3.4	3.6	12.6	---

* On Adjacent Drainage

** 1943-57 Adjusted Average

DELAYED REPORT RECEIVED SINCE LAST BULLETIN - JANUARY 15, 1964:

Bright Angel	12N1	8400	1/16	4	1.3

ARIZONA SOIL MOISTURE - ABOUT FEBRUARY 1, 1964

Drainage Basin and Station	1/ Station Number	Elev.	Soil Profile in Inches Depth	Cap.	Date	Soil Moisture Content in Inches--about FEB. 1 1964	1963	1962	Avg.
GILA RIVER									
Frisco Divide	8S1-M	8000	48	13.3	1/31	6.7	9.8	11.6	11.2
SALT RIVER									
Black River Divide	9S10-*	9100	48	16.8	1/29	11.2	11.3	12.3	10.5
Canyon Creek #2	10R7-M	7500	48	18.3	1/28	13.4	11.7	13.0	12.6
Corduroy Creek	10R8-*	6000	48	16.0	1/28	6.4	9.4	10.2	8.3
McNary	9R2-M	7200	48	16.3	1/28	6.9	7.9	8.2	8.9
VERDE RIVER									
Casner Park	11R2-M	6930	48	19.1	1/30	10.2	11.8	10.4	12.2
Mormon Mountain	11R3-M	7500	48	16.1	1/30	9.0	8.0	9.5	9.5

1/ * - Soil Moisture Station only
M - Snow Course and Soil Moisture Station

DELAYED REPORT RECEIVED SINCE LAST BULLETIN - JANUARY 15, 1964:

Frisco Divide	8S1-M	8000	48	13.3	1/14	6.6

LIST OF SNOW SURVEYORS

SNOW COURSE	SURVEYOR
Baldy	SCS and SRVWUA
Bear Wallow	Forest Service - Allan Hinds
Beaver Head	N. A. Josh
Bright Angel	National Park Service - Vern Ruesch
Camp Wood	Lyn Pehl
Canyon Creek #2	SCS and SRVWUA
Casner Park	SCS and SRVWUA
Chalender	Forest Service - Mel Richards
Copper Basin Divide	SCS - Bill Gray
Coronado Trail	Forest Service - R.P. Julander & W.L. Sanders
Forest Dale	Fort Apache Reservation - Boyer & Endfield
Ft. Apache	SCS and SRVWUA
Fort Valley	Rocky Mountain Forest & Range Experiment Station
Frisco Divide	Forest Service - Joe Clayton
Gaddes Canyon	SCS - Bill Gray
Gentry	SCS and SRVWUA
Grand Canyon	National Park Service - Paul Mathis
Hannagan Meadows	N. A. Josh
Happy Jack	Emil O. Ryberg
Heber	SCS and SRVWUA
Hummingbird	Ray Freeman
Ice King	James R. Wray
Inman	C. H. McCauley
Iron Springs	Ernest Saxby
Maverick Fork	SCS and SRVWUA
McNary	Fort Apache Reservation - Boyer & Endfield
Milk Ranch	Fort Apache Reservation - Boyer & Endfield
Mingus Mountain	SCS - Bill Gray
Mogollon	James R. Wray
Mormon Lake	SCS and SRVWUA
Mormon Mountain	SCS and SRVWUA
Munds Park	SCS and SRVWUA
Newman Park	SCS and SRVWUA
Nutrioso	Forest Service - R.P. Julander & W.L. Sanders
Pacheta	Foch Phillips
Redstone Trail	James R. Wray
Rose Canyon	Forest Service - Allan Hinds
Silver Creek Divide	James R. Wray
Snow Bowl	Forest Service - Jay Shoemaker
State Line	Forest Service - Joe Clayton
White Spar	SCS - Bill Gray
Whitewater	Ray Freeman
Willow Ranch	Tiny Miller
Workman Creek	Rocky Mountain Forest & Range Experiment Station

The Following Organizations Cooperate in the Arizona Snow Survey Work

FEDERAL

- Department of Agriculture
  - Soil Conservation Service
  - Forest Service
    - Apache Forest
    - Coconino Forest
    - Coronado Forest
    - Gila Forest
    - Kaibab Forest
    - Prescott Forest
    - Rocky Mountain Forest and Range Experiment Station
    - Tonto Forest
- Department of Commerce
  - Weather Bureau
    - Arizona Section
- Department of Interior
  - Bureau of Reclamation
    - Region III
  - Geological Survey
    - Arizona District
  - Bureau of Indian Affairs
    - Fort Apache Reservation
    - San Carlos Irrigation Project
  - National Park Service
    - Grand Canyon National Park
- Gila Water Commissioner
  - Safford, Arizona

STATE

- Arizona Agricultural Experiment Station

IRRIGATION PROJECTS

- Salt River Valley Water Users' Association
  - Phoenix, Arizona
- San Carlos Irrigation and Drainage District
  - Coolidge, Arizona

PRIVATE

- Southwest Forest Industries, Inc.
  - McNary, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ROOM 6029 FEDERAL BUILDING
PHOENIX, ARIZONA 85025

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COOPERATIVE SNOW SURVEYS

Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation , navigation , mining and industry

"The Conservation of Water begins with the Snow Survey"

1.96
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CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
ARIZONA

UNITED STATES DEPARTMENT of AGRICULTURE···SOIL CONSERVATION SERVICE,
SALT RIVER VALLEY WATER USERS ASSOCIATION
and
ARIZONA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with the Federal, State and private organizations listed on the last page of this report.

AS OF
FEB. 15, 1964

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from advance estimates of the streamflow.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, up to 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

Streamflow forecasts are obtained by a comparison of total or maximum snow accumulation, as measured by snow water equivalent, to the subsequent spring and summer or snowmelt season runoff over a period of years. The snow water equivalent measured in selected snow courses provides most of the index to the streamflow forecast for the following season. More accurate forecasts are usually obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast procedure. Early season forecasts assume average climatic conditions through the snowmelt season.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions. Soil Conservation Service Reports may be secured from Water Supply Forecasting Unit, Soil Conservation Service, P.O. Box 2807, Portland, Oregon 97208.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	LOCATION	COOPERATING WITH
RIVER BASINS			
Western United States	Monthly (Feb.-May)	Portland, Oregon	All Cooperators
Basic Data Summary	October 1	Portland, Oregon	All Cooperators
STATES			
Alaska	Monthly (Mar.-May)	Palmer, Alaska	Alaska S.C.D.
Arizona	Semi-Monthly (Jan.15 - Apr.1)	Phoenix, Arizona	Salt R. Valley Water Users Assoc. Ariz. Agr. Exp. Station
Colorado and New Mexico	Monthly (Feb.-May)	Fort Collins, Colorado	Colo. State University Colo. State Engineer N. Mex. State Engineer
Idaho	Monthly (Jan.-June)	Boise, Idaho	Idaho State Reclamation Engineer
Montana	Monthly (Jan.-June)	Bozeman, Montana	Mont. Agr. Exp. Station
Nevada	Monthly (Jan.-May)	Reno, Nevada	Nevada Dept. of Conservation and Natural Resources - Division of Water Resources
Oregon	Monthly (Jan.-June)	Portland, Oregon	Oreg. State University Oregon State Engineer
Utah	Monthly (Jan.-June)	Salt Lake City, Utah	Utah State Engineer
Washington	Monthly (Feb.-June)	Spokane, Washington	Wn. State Dept. of Conservation
Wyoming	Monthly (Feb.-June)	Casper, Wyoming	Wyoming State Engineer

PUBLISHED BY OTHER AGENCIES

REPORTS	ISSUED	AGENCY
British Columbia	Monthly (Feb.-June)	Water Resources Service, Dept. of Lands, Forest and Water Resources, Parliament Bldg., Victoria, B.C., Canada
California	Monthly (Feb.-May)	Calif. Dept. of Water Resources, P.O. Box 388, Sacramento, Calif.

USDA-SCS PORTLAND OREG 1963

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
ARIZONA

(Salt, Verde, Gila and Part of Lower Colorado River Basin)

Report prepared by

RICHARD W. ENZ...SNOW SURVEY SUPERVISOR
SOIL CONSERVATION SERVICE
ROOM 6029 FEDERAL BUILDING
PHOENIX, ARIZONA 85025

Issued by

ROBERT V. BOYLE
STATE CONSERVATIONIST
SOIL CONSERVATION SERVICE

VICTOR I. CORBELL
PRESIDENT
SALT RIVER VALLEY WATER USERS ASSOCIATION

ARIZONA
COOPERATIVE SNOW SURVEYS
Snow Courses and Sub-Watersheds

JANUARY 1964

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE USDA-SCS-PORTLAND, OREG. 1960 M-2690

7-0-19920-L

INDEX to SNOW COURSES and SOIL MOISTURE STATIONS

NUMBER **	NAME	SEC	TWP	RGE ***	ELEVATION	RIVER BASIN
9S1	Baldy (p)	28	7N	27E	9125	Salt-Little Colorado
10T1	Bear Wallow	6	12S	16E	8100	Gila
9S6	Beaver Head	13	4N	30E	8000	Salt-San Francisco
9S10-*	Black River Divide	11	6N	27E	9100	Salt-Little Colorado
12N1	Bright Angel	34	33N	3E	8400	Lower Colorado
12R1	Camp Wood	3	16N	6W	5700	Verde-Bill Williams
10R7-M	Canyon Creek #2	18	11N	15E	7500	Salt-Little Colorado
11R2-M	Casner Park	19	18N	8E	6930	Verde
12P1-M	Chalender	27	22N	3E	7100	Verde
12R6	Copper Basin Divide(p)	23	13N	3W	6720	Verde-Bill Williams
10R8-*	Corduroy Creek	Lat.34°07' N. Long.110°08'W. §			6000	Salt
9S7	Coronado Trail	26	5N	30E	8000	Salt-San Francisco
10R6	Forest Dale	2	9N	21E	6430	Salt-Little Colorado
11P2	Fort Valley (p)	22	22N	6E	7350	Verde-Little Colorado
9R5	Ft. Apache	18	7N	27E	9160	Salt-Little Colorado
8S1-M	Frisco Divide	31	6S	20W****	8000	San Francisco-Gila
12R4	Gaddes Canyon	11	15N	2E	7600	Verde-Agua Fria
10R5	Gentry	36	11N	15E	7600	Salt
11P1	Grand Canyon	21	30N	4E	7500	Lower Colorado
9S11	Hannagan Meadows (p)	19	3N	29E	9090	Salt
11R5	Happy Jack	30	17N	9E	7630	Verde
10R4	Heber (p)	28	11N	15E	7600	Salt-Little Colorado
8S9-A	Hummingbird	19	11S	17E	10,550	San Francisco-Gila
8S6	Ice King	6	11S	18W****	8020	San Francisco-Gila
7S2	Inman	6	11S	10W****	7800	Gila
12R2	Iron Springs	22	14N	3W	6200	Verde-Bill Williams
9S2	Maverick Fork (p)	13	6N	27E	9050	Salt
9R2-M	McNary	14	8N	23E	7200	Salt-Little Colorado
9R1	Milk Ranch	28	8N	23E	7000	Salt
12R3	Mingus Mountain	3	15N	2E	7100	Verde-Agua Fria
8S2	Mogollon	2	11S	19W****	7000	San Francisco-Gila
11R4	Mormon Lake	13	18N	8E	7350	Verde-Little Colorado
11R3-M	Mormon Mountain (p)	14	18N	8E	7500	Verde
11R1-M	Munds Park	7	18N	7E	6500	Verde
11P5-M	Newman Park	25	19N	6E	6750	Verde
9S4	Nutrioso	23	6N	30E	8500	San Francisco-Little Colorado
9S5	Pacheta	At Town of Maverick, Ariz.			§ 7800	Salt
8S7	Redstone Trail	5	11S	18W****	8600	San Francisco-Gila
10T2	Rose Canyon	15	12S	16E	7300	Gila
8S8	Silver Creek Divide	4	11S	18W****	9000	San Francisco
11P4	Snow Bowl (p)	36	23N	6E	10,260	Verde
9S8	State Line	6	6S	21W****	8000	Gila-San Francisco
12R5	White Spar	19	13N	2W	6000	Verde
8S10-A	Whitewater	19	11S	17E	10,750	Gila
13P1	Willow Ranch	16	21N	11W	5000	Bill Williams
10S1	Workman Creek	33	6N	14E	6900	Salt

* Soil Moisture Station only

** Number indicates location of snow course within coordinate rectangle. Thus 9N1 is Course #1 in coordinate rectangle 9N.

*** All in Gila and Salt River Base and Meridian except where otherwise indicated.

**** New Mexico Principal Meridian

M Soil Moisture Station installed on or in vicinity of snow course.

§ Unsurveyed

(p) Storage gage installed on or in vicinity of snow course.

A Aerial Snow Depth Gage

ARIZONA WATER SUPPLY OUTLOOK

FEBRUARY 15, 1964

* *
* The surface water supply outlook is considerably below normal for *
* the major irrigated areas of Arizona. Snow cover is less than one *
* third of average, but Reservoir Storage is fair to good. Very low *
* runoff is forecast this year, ranging from 21% to 53% of average. *
* *

SNOW COVER: Storm activity the last two weeks has resulted in very little increase in snow cover. Only a few snow courses in the White Mountains and Mogollon Mountains showed small increases since February 1. The snow cover on the Verde River Watershed has diminished to where it is now 20% of average. The lower elevations of the Salt River Watershed picked up a little snow, but the higher elevation courses in the White Mountains still measure only 32% of average. Twenty-seven percent of normal snow exists on the Gila and San Francisco Watersheds.

RESERVOIR STORAGE: Storage in the Salt River Project Reservoirs dropped 1,600 acre feet since February 1. They now contain 105% of average and 39% of capacity. San Carlos Reservoir showed a slight increase in storage, but contains only 65% of normal for this date. Lyman Reservoir still contains carry-over storage from 1962, with 167% of average and 33% of acpacity. Lake Pleasant and Show Low Lake are both very low.

SOIL MOISTURE: Soil moisture is 85% of average at our measuring stations. Due to the light snow cover the surface foot of soil is frozen at many locations. Heavy precipitation accompanied by warm temperatures could result in good run-off from these areas.

PRECIPITATION: The precipitation pattern set in January has continued into February. Many stations reported only a trace of precipitation so far in February. The maximum reported was at Maverick where .53" was received.

STREAMFLOW AND WATER SUPPLY: The combined flow of the Salt, Verde, and Tonto Rivers during January was the lowest since 1913, according to the Records and Analysis Section of the Salt River Project; this trend is continuing in February. The Gila River is holding up better, producing 68% of average for the first fifteen days in February.

Streamflow forecasts have all been reduced since the February 1 report. Forecasts now range from 21% of average on the Little Colorado River, to 53% of average on the Gila River. The combined flow into the Salt River Project Reservoirs is expected to be 32% of average. The Gila River near Solomon is forecast to produce 11,000 acre feet during the month of March. If watershed conditions continue to get worse it may flow as low as 6,000 acre feet.

Combining the present storage, the forecast spring runoff, and the normal expected summer runoff, the water supply outlook for the Salt River Project is 85% of 1943-57 average.

Surface water supplies for irrigation will be short in most areas of Arizona this year. Heavy supplemental pumping will be required on the San Carlos Project, the Salt River Project, and in the Upper Gila Valley. Efficient use of irrigation water by farmers will help to reduce pumping needs.

STREAM FLOW FORECASTS - FEBRUARY 15, 1964

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts.

SUB-WATERSHED, STREAM and STATION	SEASONAL STREAM FLOW IN THOUSANDS OF ACRE FEET FORECAST PERIOD: FEBRUARY - MAY, INCLUSIVE					
	Forecast Runoff 1964	Percent 15-Year Average	Measured Runoff 1963	1962	1961	1943-57 Average
Salt River at Intake	80	35	191.1	536.6	75.9	226.4
Tonto River above Roosevelt	11	34	10.2	52.2	5.5	32.6
Verde River above Horseshoe	42	27	43.6	229.6	58.8	158.4
Gila River nr Virden	18	51	55.4	117.2	17.8	35.3
Gila River near Solomon	31	48	104.3	229.3	25.8	64.9
Frisco River at Clifton	16	53	45.3	117.2	13.9	30.2
Little Colorado River above Lyman Dam (FEB.-JUNE, Incl.)	1.3	21	2.6	26.4	1.1	6.1
Gila River nr Solomon (Month of March)	11	42	22.1	36.8	6.7	26.3

Gila River near Solomon is forecast to remain above 100 cfs until April 7.

Granite Creek is still forecast to fill Watson Lake if normal precipitation is received the remainder of the period.

STATUS OF ARIZONA RESERVOIR STORAGE - ABOUT FEBRUARY 15, 1964

SUB-WATERSHED and/or STREAM	RESERVOIR	USABLE CAPACITY 1000s AC. FT.	USABLE STORAGE - 1000s ACRE FEET			
			1964	1963	1962	15-Year Average 1943-57
GILA RIVER SUB-WATERSHED						
Agua Fria	Lake Pleasant	163.8	16.1	2.8	13.6	23.5
Granite	Watson Lake	4.7	3.9	0.7	--	--
Gila	San Carlos	1,206.0	65.8	112.1	138.8	100.8
Verde	Bartlett	179.5	14.4	18.1	72.9	49.4
Verde	Horseshoe	142.8	1.6	1.6	34.8	11.1 *
Salt	Roosevelt	1,382.0	436.0	694.6	643.0	434.7
Salt	Apache	245.0	235.0	225.0	170.7	200.9
Salt	Canyon	58.0	50.9	52.4	56.4	37.7
Salt	Saguaro	70.0	66.8	64.3	65.5	33.6
LOWER COLORADO RIVER SUB-WATERSHED						
Colorado	Lake Havasu	619.4	530.0	534.8	547.4	552.6
Colorado	Lake Mohave	1,810.0	1,666.0	1,707.0	1,746.0	1,441.1 *
Colorado	Lake Mead	27,207.0	15,282.0	22,587.0	17,902.0	17,200.0
Little Colo.	Lyman	30.6	10.2	13.3	2.1	6.1
Little Colo.	Show Low Lake	5.1	0.8	1.0	5.1	--

* Average is for less than 15 years of record in the 1943-57 period.

WATER SUPPLY INVENTORY

SALT RIVER VALLEY SYSTEM

FEBRUARY 15, 1964

ACRE FEET

3,000,000

2,500,000

2,000,000

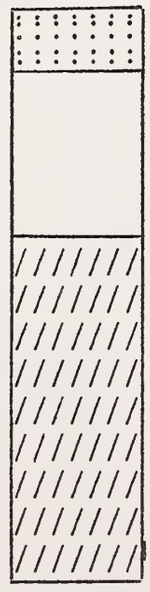
1,500,000

1,000,000

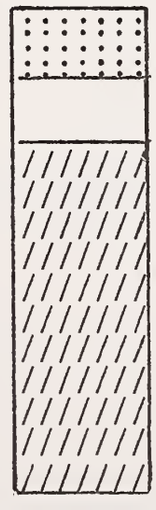
500,000

0

AVERAGE SUPPLY ON FEBRUARY 15



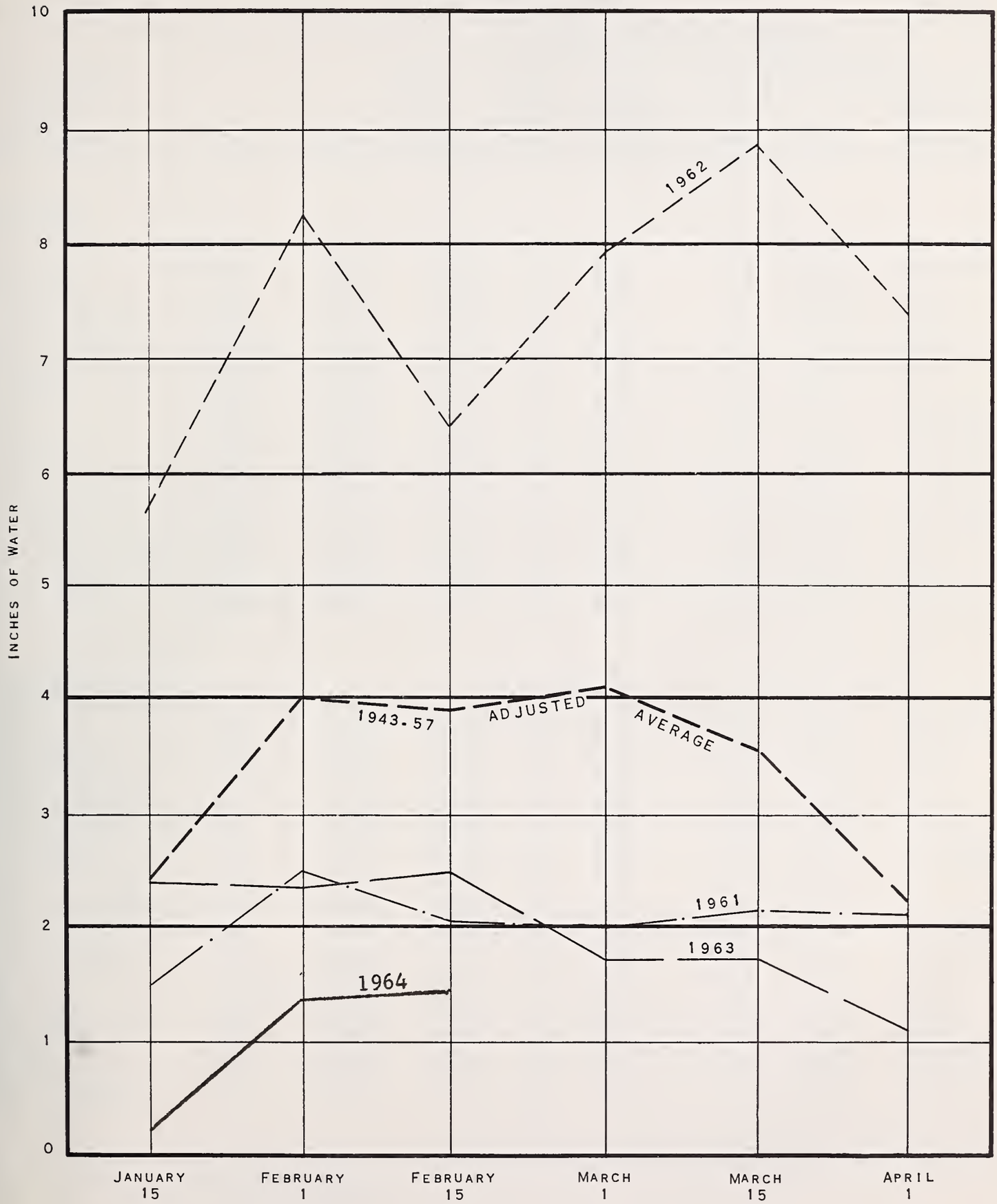
ANTICIPATED 1964 SUPPLY *



* Based on present Storage + Forecast Spring runoff + Average Summer runoff.

RELATIVE SNOW WATER ACCUMULATION
ARIZONA

FEBRUARY 15, 1964



This graph represents the average snow water content on eleven selected snow courses on Arizona Sub-Watersheds.

FEBRUARY 15, 1954

ARIZONA SNOW SURVEYS - ABOUT FEBRUARY 15, 1964

SUB-WATERSHED and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1964 Date of Survey	Snow Depth (In.)	Water Content (In.)	PAST RECORD Water Content (Inches) 1963	1962	1943-57 Average
GILA RIVER								
Bear Wallow	10T1	8100	2/13	2	0.6	4.1	11.6	2.4 **
Beaver Head	9S6	8000	2/14	2	0.8	1.6	6.2	2.6
Coronado Trail	9S7	8000	2/14	2	0.4	1.6	3.4	2.5
Frisco Divide	8S1-M	8000	2/14	4	0.8	1.0	2.6	1.7
Hummingbird 1/	8S9-A	10550	2/15	48	6.2	---	---	---
Ice King	8S6	8020	2/14	10	2.1	6.2	10.9	---
Inman	7S2	7800	2/13	0	0.0	1.8	T	0.6 **
Mogollon	8S2	7000	2/14	0	0.0	3.1	4.9	1.4 **
Nutrioso	9S4	8500	2/14	3	0.7	1.1	2.3	1.9
Redstone Trail	8S7	8600	2/14	12	2.7	10.0	14.6	---
Rose Canyon	10T2	7300	2/13	1	0.3	3.0	7.9	1.3 **
Silver Creek Div.	8S8	9000	2/14	17	3.8	---	---	---
State Line	9S8	8000	2/14	2	0.5	1.5	2.5	2.1
Whitewater 1/	8S10-A	10750	2/15	36	5.5	---	---	---
SALT RIVER								
Baldy *	9S1	9125	2/12	11	2.1	4.9	12.6	6.9 **
Beaver Head	9S6	8000	2/14	2	0.8	1.6	6.2	2.6
Canyon Creek #2	10R7-M	7500	2/11	7	1.6	1.4	3.2	---
Coronado Trail	9S7	8000	2/14	2	0.4	1.6	3.4	2.5
Forest Dale	10R6	6430	2/14	7	1.1	0.8	1.3	1.1
Ft. Apache *	9R5	9160	2/12	14	2.6	6.0	12.7	7.3 **
Gentry	10R5	7600	2/12	8	1.9	2.0	2.9	3.3 **
Hannagan Meadows	9S11	9090	2/14	13	3.1	---	---	---
Heber	10R4	7600	2/11	6	1.4	1.9	4.3	3.5 **
Maverick Fork	9S2	9050	2/12	14	2.6	5.8	14.3	8.4 **
McNary	9R2-M	7200	2/14	8	1.8	2.2	4.2	2.2
Milk Ranch	9R1	7000	2/14	4	0.9	2.1	2.4	1.4
Nutrioso *	9S4	8500	2/14	3	0.7	1.1	2.3	1.9
Pacheta	9S5	7800	2/14	4	1.8	4.4	6.0	3.0 **
Workman Creek	10S1	6900	2/12	11	3.2	4.5	11.5	3.8 **

* On Adjacent Drainage
** 1943-57 Adjusted Average

1/ Aerial observation: Water contents estimated.

ARIZONA SNOW SURVEYS - ABOUT FEBRUARY 15, 1964

SUB-WATERSHED and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENTS 1964 Date of Survey	Snow Depth (In.)	Water Content (In.)	PAST RECORD Water Content (Inches) 1963	1962	1943-57 Average
VERDE RIVER								
Camp Wood	12R1	5700	2/12	0	0.0	0.0	0.0	0.9 **
Casner Park	11R2-M	6930	2/11	3	0.7	1.5	6.1	3.8 **
Chalender	12P1-M	7100	2/14	6	1.4	0.7	4.7	3.2 **
Copper Basin Div.	12R6	6720	2/14	0	0.0	2.8	---	---
Fort Valley	11P2	7350	2/14	0	0.0	1.0	3.9	2.5 **
Gaddes Canyon	12R4	7600	2/14	2	0.4	2.7	7.6	---
Happy Jack	11R5	7630	Report Delayed			2.9	5.0	4.1 **
Iron Springs *	12R2	6200	2/14	0	0.0	T	0.0	1.3 **
Mingus Mountain	12R3	7100	2/14	0	0.0	1.4	0.0	1.3 **
Mormon Lake *	11R4	7350	2/11	7	1.7	1.4	5.8	4.8 **
Mormon Mountain	11R3-M	7500	2/11	5	1.4	2.0	7.5	6.6 **
Munds Park	11R1-M	6500	2/11	0	0.0	1.0	3.4	2.2 **
Newman Park	11P5-M	6750	2/11	1	0.1	0.9	---	---
Snow Bowl	11P4	10260	Report Delayed			4.8	11.6	---
White Spar	12R5	6000	2/14	0	0.0	1.1	---	---
BILL WILLIAMS RIVER								
Camp Wood *	12R1	5700	2/12	0	0.0	0.0	0.0	0.9 **
Copper Basin Div.	12R6	6720	2/14	0	0.0	2.8	---	---
Iron Springs	12R2	6200	2/14	0	0.0	T	0.0	1.3 **
Willow Ranch	13P1	5000	2/14	0	0.0	0.0	0.0	0.4 **
LOWER COLORADO RIVER								
Bright Angel	12N1	8400	No Survey			No Survey		8.0 **
Chalender *	12P1-M	7100	2/14	6	1.4	0.7	4.7	3.2 **
Fort Valley	11P2	7350	2/14	0	0.0	1.0	3.9	2.5 **
Grand Canyon	11P1	7500	2/14	0	0.0	1.1	2.7	2.4 **
LITTLE COLORADO RIVER								
Baldy	9S1	9125	2/12	11	2.1	4.9	12.6	6.9 **
Canyon Creek #2	10R7-M	7500	2/11	7	1.6	1.4	3.2	---
Forest Dale	10R6	6430	2/14	7	1.1	0.8	1.3	1.1
Ft. Apache	9R5	9160	2/12	14	2.6	6.0	12.7	7.3 **
Fort Valley	11P2	7350	2/14	0	0.0	1.0	3.9	2.5 **
Gentry	10R5	7600	2/11	8	1.9	2.0	2.9	3.3 **
Happy Jack *	11R5	7630	Report Delayed			2.9	5.0	4.1 **
Heber	10R4	7600	2/11	6	1.4	1.9	4.3	3.5 **
McNary	9R2-M	7200	2/14	8	1.8	2.2	4.2	2.2
Mormon Lake	11R4	7350	2/11	7	1.7	1.4	5.8	4.8 **
Mormon Mountain	11R3-M	7500	2/11	5	1.4	2.0	7.5	6.6 **
Nutrioso	9S4	8500	2/14	3	0.7	1.1	2.3	1.9
Snow Bowl	11P4	10260	Report Delayed			4.8	11.6	---

* On Adjacent Drainage

** 1943-57 Adjusted Average

PRECIPITATION AT SELECTED ARIZONA STATIONS *

STATION	Precipitation (Inches)			
	January - 1964		Current Water-Year (Oct. 1963 - Jan. 1964)	
	Total	Departure from Normal	Total	Departure from Normal
Alpine	.61	- .99	4.69	- .71
Ash Fork	1.17	+ .15	4.03	+ .41
Clifton	--	- .91	2.30	- 1.07
Douglas Smelter	.12	- .60	1.83	- .66
Flagstaff WBAS **	1.07	- .76	4.07	- 1.93
Payson Ranger Station	.84	- 1.28	6.49	- .38
Phoenix WBAS	.22	- .51	2.41	- .12
Prescott WBAS	.32	- .69	2.31	- .93
Springerville	T	- .71	1.64	- .80
Tucson WBAS	.14	- .68	2.08	- .92
Winslow WBAS	.03	- .40	1.75	- .22
Yuma WBAS	T	- .39	1.11 #	- .10

** WBAS = Weather Bureau Airport Station

Corrected value.

* Data and Analysis furnished by Paul C. Kangieser, Arizona State Climatologist, U. S. Weather Bureau, Phoenix, Arizona

ARIZONA SOIL MOISTURE - ABOUT FEBRUARY 15, 1964

Drainage Basin and Station	1/ Station Number	Elev.	Soil Profile in Inches Depth	Cap.	Date	Soil Moisture Content in Inches--about FEB. 15 1964	1963	1962	Avg.
GILA RIVER									
Frisco Divide	8S1-M	8000	48	13.3	2/14	6.4	10.5	12.9	11.2
SALT RIVER									
Black River Divide	9S10-*	9100	48	16.8	2/12	11.0	11.9	12.3	10.5
Canyon Creek #2	10R7-M	7500	48	18.3	2/11	13.2	13.2	13.3	13.0
Corduroy Creek	10R8-*	6000	48	16.0	2/12	6.7	8.2	10.7	8.4
McNary	9R2-M	7200	48	16.3	2/12	8.0	10.3	8.1	8.8
VERDE RIVER									
Casner Park	11R2-M	6930	48	19.1	2/11	9.1	17.1	14.3	13.2
Mormon Mountain	11R3-M	7500	48	16.1	2/11	9.1	14.8	11.6	10.5

1/ * - Soil Moisture Station only
M - Snow Course and Soil Moisture Station

LIST OF SNOW SURVEYORS

SNOW COURSE	SURVEYOR
Baldy	SCS and SRVWUA
Bear Wallow	Forest Service - Allan Hinds
Beaver Head	N. A. Josh
Bright Angel	National Park Service - Vern Ruesch
Camp Wood	Lyn Pehl
Canyon Creek #2	SCS and SRVWUA
Casner Park	SCS and SRVWUA
Chalender	Forest Service - Mel Richards
Copper Basin Divide	SCS - Bill Gray
Coronado Trail	Forest Service - R.P. Julander & W.L. Sanders
Forest Dale	Fort Apache Reservation - Boyer & Endfield
Ft. Apache	SCS and SRVWUA
Fort Valley	Rocky Mountain Forest & Range Experiment Station
Frisco Divide	Forest Service - Joe Clayton
Gaddes Canyon	SCS - Bill Gray
Gentry	SCS and SRVWUA
Grand Canyon	National Park Service - Paul Mathis
Hannagan Meadows	N. A. Josh
Happy Jack	Emil O. Ryberg
Heber	SCS and SRVWUA
Hummingbird	Ray Freeman
Ice King	James R. Wray
Inman	C. H. McCauley
Iron Springs	Ernest Saxby
Maverick Fork	SCS and SRVWUA
McNary	Fort Apache Reservation - Boyer & Endfield
Milk Ranch	Fort Apache Reservation - Boyer & Endfield
Mingus Mountain	SCS - Bill Gray
Mogollon	James R. Wray
Mormon Lake	SCS and SRVWUA
Mormon Mountain	SCS and SRVWUA
Munds Park	SCS and SRVWUA
Newman Park	SCS and SRVWUA
Nutrioso	Forest Service - R.P. Julander & W.L. Sanders
Pacheta	Foch Phillips
Redstone Trail	James R. Wray
Rose Canyon	Forest Service - Allan Hinds
Silver Creek Divide	James R. Wray
Snow Bowl	Forest Service - Jay Shoemaker
State Line	Forest Service - Joe Clayton
White Spar	SCS - Bill Gray
Whitewater	Ray Freeman
Willow Ranch	Tiny Miller
Workman Creek	Rocky Mountain Forest & Range Experiment Station

The Following Organizations Cooperate in the Arizona Snow Survey Work

FEDERAL

Department of Agriculture

Soil Conservation Service

Forest Service
- Apache Forest
- Coconino Forest
- Coronado Forest
- Gila Forest
- Kaibab Forest
- Prescott Forest
- Rocky Mountain Forest and Range Experiment Station
- Tonto Forest

Department of Commerce
- Weather Bureau
  - Arizona Section

Department of Interior

Bureau of Reclamation
- Region III

Geological Survey
- Arizona District

Bureau of Indian Affairs
- Fort Apache Reservation
- San Carlos Irrigation Project

National Park Service
- Grand Canyon National Park

Gila Water Commissioner
- Safford, Arizona

STATE

Arizona Agricultural Experiment Station

IRRIGATION PROJECTS

Salt River Valley Water Users' Association
- Phoenix, Arizona

San Carlos Irrigation and Drainage District
- Coolidge, Arizona

PRIVATE

Southwest Forest Industries, Inc.
- McNary, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

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"The Conservation of Water begins with the Snow Survey"